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Description of a New Deep-Sea Fish of the Genus *Rondeletia* from Japan

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Thanks to the cooperation of Mr. Yasoji ENDÔ, a specimen of a rare deep-sea fish resembling *Rondeletia bicolor* GOODE & BEAN of the family Rondeletiidae has been received for study. The specimen was caught early in October, 1962, 30 miles off Kesen-numa, Miyagi Prefecture, by the "Tomoe-maru" (two-boat-type trawler), at a depth of 750 m., and was preserved in formalin till February 7, 1963, when the red color of the buccal cavity and some other parts of the body still remained reminding the senior author of the colored plate given by BEEBE and of the reproduced plate published by HARRY of the "giant-mouthed orange skin", *Rondeletia bicolor*. But close examination of the specimen has revealed that it represents a different species which is believed to be new to science. The authors take pleasure in expressing here their cordial thanks to Mr. ENDÔ for his cooperation.

Rondeletia loricata, new species

Akatchokki-kudjirauo* (new Japanese name)
Pl. XI, figs. 1-7, pl. XII, figs. 8 & 9

?*Rondeletia bicolor* ROFEN, 1959, pp. 259 & 260, pl. 2, fig. 4. Probably not of GOOD & BEAN.

Study material.—Only the holotype, Cat. No. 52196, Zoological Institute, Faculty of Science, University of Tokyo, has been available. The data of the specimen are partly given above. Total length 122 mm., fork length 111 mm., standard length (the hind end of the vertebral column exposed on the right side) 102 mm. There are a pair of fairly large ovaries.

Measurements and counts.—

Lengh of head 50 mm. (left) & 48 mm. (right).
Greatest depth of body 36 mm.
Greatest breadth of body (near pectoral base) 20 mm.
Breadth of body between extremities of supraclavicles 19 mm.
Breadth of body at belly 16 mm.
Least depth of caudal peduncle 10 mm.

* Aka means red. Tchokki means waistcoat. Kudjira means whale. Uo means fish. Kudjirauo means cetomimids. Waistcoat refers to the remarkably expanded and swollen bones of the pectoral girdle which were reddish even after four months' preservation in formalin. The new specific name *loricata* is given in reference to this pectoral girdle.

Length of snout 26 mm. on either side.
Horizontal diameter of eye *ca.* 3.5 mm. on either side.
Bony interorbital breadth above eye-centers 18 mm.
Distance from snout tip to upper angle of pectoral base 51 mm. on either side (nearly equal to distance from latter point to posterior end of dorsal base).
Distance from snout tip to upper angle of pelvic base 71 mm. (left) & 72 mm. (right).
Distance from snout tip to dorsal origin 76 mm.
Distance from snout tip to anal origin 79 mm.
Length of dorsal base 25 mm.
Length of anal base 21 mm.
Length of longest caudal fin-ray 14 mm.
Length of longest dorsal fin-rays (around 8th-10th) *ca.* 13 mm.
Length of longest anal fin-rays (around 8th-10th) *ca.* 12 mm.
Length of longest pectoral fin-rays *ca.* 12 mm. (left) & 11 mm. (right; 4th from top; stained).
Length of longest pelvic fin-ray *ca.* 10 mm. (left) & *ca.* 11 mm. (right).
Length of longest gill-raker 6 mm. (on either side).

D. 16. A. 14. P. 11. (=ii+8+i) (left) & 10 (=ii+7+i; all segmented) (right). V. 5 (all rays divided, segmented and branched) on either side. C. (principal rays) i+17 (branched) +i. Gill-rakers 6+1+14 (left) & 6+1+15 (right). Branchiostegals 7 (left) & *ca.* 6 (right). Gills 4; a slit of moderate size behind the 4th arch. Pseudobranchiae extremely small in size.

General appearance and coloration.—The body is nearly eliptical, compressed posteriorly, scaleless, and the skin is very soft. The head is large, its length being about 1/2 of the standard length. The fins are all small in size, the paired ones and the caudal being unproportionately weak. The dorsal and anal fins are placed far back. The pelvic origins are situated far behind the pectoral tips and a little in advance of the vertical through the dorsal fin, and the pelvic fins extend beyond the whitish area around the vent just reaching the anal origin. The pectoral fins are placed low down. The mouth is large. The lower jaw slightly projects beyond the upper, and is provided with a small knob at the symphysis. The margin of the upper jaw is formed only by the attenuated and flexible premaxillary on either side, and the hind end of the fairly large supramaxillary reaches just below the vertical through the anterior margin of the small eye, the center of which is a little behind the middle of the head leaving the long and spacious snout and the spacious cheek naked. The interorbital flat area is wide from near the snout tip back to the posterior end of the cranium, and laterally bordered by an elevation of the frontal on either side. The vertical elevation of the preoperculum is conspicuous.

The nostrils are paired on either side, and the posterior one is provided with a

triangular skinny flap at its anterior end. The distance from the snout tip to the hind margin of the posterior nostril is nearl equal to the distance from the latter to the hind margin of the eye. There are 4 whitish pits arranged in a straight line which is parallel to the upper contour of the maxillary; the anteriormost pit is just below the anterior nostril, and the hindmost pit is below the eye. There are 4 pairs of similar pores in the interiorbital area; the anteriormost pair are situated above the posterior half of the anterior nostril on either side, and the posteriormost pair are above the junction of the reddish preoperculum with the semitransparent cranium*. The bones of the pectoral girdle, and more especially the posttemporal and clavicle on either side, are very unusual in shape and color. The posttemporal is the largest, triangular in outline, and elevated laterally, making the back wider than the head. The lower limb of the clavicle is expanded, and extends nearly horizontally rearwards, reaching the vertical through the hind end of the pectoral fin, the base of which is well protected by the swollen upper and lower limbs of the clavicle (pl. XI, figs. 1, 4-7, pl. XII, figs. 8 & 9). Ordinary lateral lines are not visible, but there are minute pits arranged in short paler straight lines on the side of the body which are vertical to the longitudinal axis of the body. The color of the body is black (in formalin). The buccal and branchial cavities and fins are reddish.

Teeth.—Teeth are extremely small, close-set, rather blunt at the tip and present only on jaws. The upper jaw teeth form a fairly broad band, the posterior part of which is visible from outside. The tooth band of the lower jaw is attenuated posteriorly.

Skeleton and viscera.—As the material for study has been the single tpye specimen, the examination of the internal structures has been made rather passingly disscecting the right half of the body and using radiographs. The skeleton, like the skin and muscle, is not hard. The neural and haemal spines, the proximal segments of the dorsal and anal radials, and the ribs are much attenuated. Excepting for the proximal segments of the radials, the bones just mentioned are irregularly curved. The number of the precaudal vertebrae is 11 as in *R. bicolor*, and the number of the caudal vertebrae is 16, again as in *bicolor*. The penultimate and antepenultimate vertebrae are considerably smaller than the other vertebrae. As to the pectoral girdle and some of the head bones, mention was made briefly in the preceding pages because the soft skin has been partly rubbed off and because some bones are visible without dissecting.

In contrast to the extraordinarily well developed bones of the posttemporal and calvicle, the scapula and coracoid are fairly small, and the pterygiophores which number 4 are extremely small. The postclavice is single, for the most part attenuated, and slightly expanded on top forming a small, striated (rather, honey-combed)

* The color of the preoperculum and cranium is invisible from outside. The black skin is broken in the present specimen at elevated places probably rubbed off in the net.

lamina. The outer surface of the clavicle is finely honey-combed. The supraclavicle is not greatly developed, but a vertical bar of moderate size, and honey-combed on the surface like the head bones and the clavicle.

As for the viscera, in the absence of specimens of *R. bicolor*, comparison will be made with the descpription and figures given by PARR, 1929, pp. 43 & 44, fig. 19. The stomach is a larg ovoid occupying the greater part of the coelom which is lined blackish, and situated nearly mesially. Its wall is thick, tough, and blackish posteriorly. The pylorus is situated in the posterior part of the ventral line of the stomach. The intestine is pale, situated mostly on the right side of the stomach making a single long loop with a small secondary loop at the top of the longer loop. The pyloric caeca number 6, and increase in length towards the lowermost, excepting for which the caeca are situated on the right side of the stomach. The uppermost caecum is nearly triangular in shape. The gall-bladder is situated near the center of the wall of the right side of the stomach. The liver is bilobed; the right lobe is much smaller than the left of which the longitudinal axis is horizontal.

There is a small (smaller in diameter than the gall-bladder), flat, seemingly glandular pancake-shaped organ attached to the left side of the postero-ventral corner of the large loop of the intestine. This organ is probably the spleen as suggested by PARR for *R. bicolor*.

The ovaries are paired; the left one is fairly larger than the right.

There is a depressed spongy organ inserted between the stomach and the thickened and simple kidney. It ends posteriorly between the dorsal parts of the ovaries. The anterior end of this organ is in advance of the vertical through the gall-bladder. Although histological examinations have not been made, this organ seems to represent a fat-invested swimbladder.

Unlike *R. bicolor*, the present species seems to have a fairly small urinary bladder attached to the postero-dorsal side of the ovaries. It appears to be a fibrous pouch.

Distinctive characters and relationships.—In the absence of sufficient material now at hand, it is thought better to leave the discussion of the order or orders to which the present new species, Rondeletiidae and Barbourisiidae belong for tuture study. Here the writers tentatively place the present new species in the genus *Rondeletia*, the only genus of the family Rondeletiidae. The present new species is certainly much nearer to *Rondeletia bicolor* GOOD & BEAN than to any other species of Barboursiidae and the so-called Cetomimidae in the shape, nature of skin, lack of vomerine teeth, number of vertebrae, *etc.*, but differs from *bicolor* in the position of the hind end of the upper jaw, and in having smaller eyes, and unusually well developed pectoral girdle. The lateral line seems to differ between the two species, but the present writer doubts whether the sentence in the original description of *bicolor*, "No vestiges of a lateral line", was correct. The latest account by Dr. ROFEN of *bicolor* leaves some doubt as to the shape of the pectral girdle, but the size of

the eyes, the position of the hind end of the upper jaw and the lateral line system (all judged from his figure) suggest that his fish is *loricata*.

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